

THE PTERYLOSIS OF *COUA CAERULEA*

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THE monotypic cuculiform genus *Coua* is restricted in range to the island of Madagascar. The genus and its ten species form the subfamily Couinae (Peters, 1940:64-66). Little has been written about the anatomy of the genus *Coua*. Milne-Edwards and Grandidier (1879) illustrated the skeleton of several species and presented measurements of certain bones. Beddard (1885:174 and 187) described the syrinx of *Coua ruficeps* from one of Garrod's manuscripts, and stated that the myological formula was ABXYAm. Pycraft (1903) illustrated the skull, sternum, and shoulder girdle of *C. reynaudi*. Grassé (1950:529) presented a photograph of palatal structures of a young *C. cristata*. So far as I can tell, this genus has been placed in a separate subfamily primarily because of its restricted range.

The pattern exhibited by the major feather tracts has long been used as an aid in taxonomy. The pterylosis of several genera of cuckoos has been described, and Beddard (1885:187) used the condition of the ventral feather tract as one of three characters in subdividing the family Cuculidae, although he stated (1898:275) that the pterylosis of *Coua* was unknown. On the basis of leg muscle formula and structure of the syrinx, he assumed tentatively (1898:281) that the ventral feather tract of *Coua* was bifurcate and occupied the "whole of [the] space between [the] jaws." As can be seen from figure 1 and the description below, the latter part of his assumption was incorrect.

The two figures illustrating this paper make unnecessary a detailed description of the feather tracts. It does seem pertinent, however, to mention certain points not readily perceived by reference to the drawings, and certain features which I believe eventually may be of assistance in determining relationships within the family Cuculidae. Terminology used here follows that of Burt (1929).

Ventral tract. The inter-ramal region has a row three feathers wide on each side of the midline. There is a marginal apertion on the lateral sides of this tract; thus, the ventral tract does not occupy the entire inter-ramal space (see Lowe, 1943, text-figure 7, for an example of a completely feathered inter-ramal space). The ventral cervical tract is complete in the throat region, but bifurcates about 40 mm. caudal to the posterior margin of the gonys. At the junction of neck and thorax the cervical tract broadens out to cover nearly the entire anterolateral aspect of the thorax. As a result, a solid tract covers the lateral sternal and the axillary regions. Anteriorly, a single row of feathers passes laterad

¹ This study would not have been possible had it not been for the generosity of Dr. Jacques Berlioz, Muséum National d'Histoire Naturelle, Paris, who sent me an alcoholic specimen. I also am happy to acknowledge my indebtedness to my friend Mr. David F. Parmelee who made the feather-by-feather drawings. These were made with the greatest attention to detail and accuracy.

to become continuous with the ventral marginal coverts. Two abdominal branches, separated by a lateral abdominal apterion, arise from the posterior margin of the sternal-axillary region. The inner abdominal branch, consisting of a double row of feathers, forms two successive gentle curves as it passes caudad to terminate at the anterolateral margin of the anal eirelet. The outer abdominal branch, consisting of a double row of feathers anteriorly, but of a single row posteriorly, extends caudad parallel to the inner abdominal branch, which it curves inward to meet about 20 mm. anterior to the anus. There is a complete anal eirelet of feathers.

Capital tract. There is a small, triangular, median frontal apterion, and a much wider lateral apterion extending through the superciliary and occipital regions. Between the two lateral apteria there is a solid tract, covering the frontal, coronal, and occipital regions. This tract is continuous with the wedge-shaped *spinal cervical tract*. The latter is broadest at the base of the skull, and tapers to a width of two feathers a short distance posterior to the shoulder joint. The posterior half of the cervical tract is raised above the level of the surrounding skin, so that the break between the cervical tract and the feathers of the scapular region is even more pronounced than it was possible to indicate in figure 2. The scapular region is covered by four widely separated rows of four feathers each, and is connected with the cervical spinal tract by a single feather. Posteriorly, the scapular region is continuous with the more compact *dorsal spinal tract*, in which the rows contain six (anteriorly) or five (posteriorly) feathers. The two dorsal tracts converge at the midline to form a *median pelvic tract* which terminates anterior to the oil gland. A peculiar feature is the presence of a single row of feathers down the midline in the median dorsal apterion.

Humeral tract. The well developed outer, or major, humeral tract contains three (anteriorly) and four (posteriorly) rows of closely spaced feathers. This tract, also, is raised above the level of the surrounding skin. There is an inner, curved, humeral tract (not raised above the surrounding skin) consisting of a single row of feathers. Two pairs of widely separated feathers are located between the two humeral tracts.

Alar tract. There are ten primaries, ten greater primary coverts, and four or five middle primary coverts. There are five alula quills. A carpal covert and remex are present.

Like other cuckoos thus far studied, *Coua caerulea* is quintocubital. There are ten secondaries, 11 greater secondary coverts, 11 middle secondary coverts, and 11 lesser secondary coverts, although two shorter rows are interposed between the latter and the dorsal marginal coverts. The three rows of coverts are continuous with the tertials at the elbow.

Caudal tract. There are ten rectrices, but there are only eight upper tail-coverts. The oil gland is nude. It is, however, covered superficially by three feathers. One of these arises in the midline anterior to the gland, while the other two arise anterolaterally, and their shafts pass posteromesiad to cross near the posterior tip of the gland.

Femoral tract. This is an extensive, uniform tract covering the entire lateral and the upper half of the posterior aspects of the thigh.

Crural tract. This tract is strongest on the anterior and posterior aspects of the crus. Laterally the feathers form a symmetrical pattern, but they are more widely spaced. The central portion of the medial aspect of the thigh and crus is devoid of feathers.

A lateral view of the specimen reveals a wide lateral cervical apterion, widest at the junction of neck and thorax, and narrowest inferior to the ear opening. There is an extensive, pigmented bare area in the superciliary, sub-ocular, and occipital regions. Well developed "eye-lashes" are present on both lids—those on the upper lid being about 5 mm. in length; those of the lower lid are shorter. The lateral abdominal region is al-

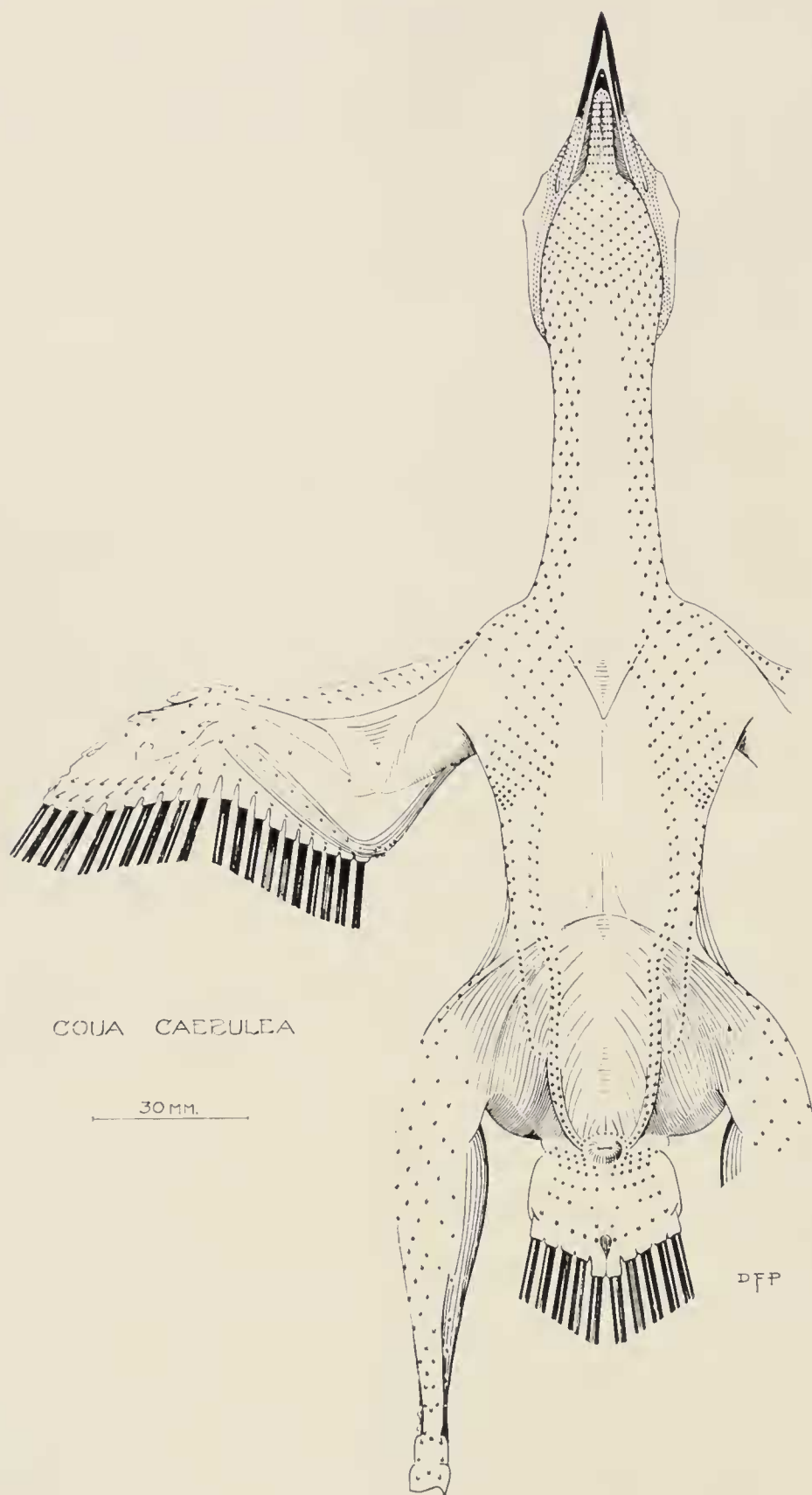


FIG. 1. Ventral view of *Cooua caerulea* showing feather tracts.

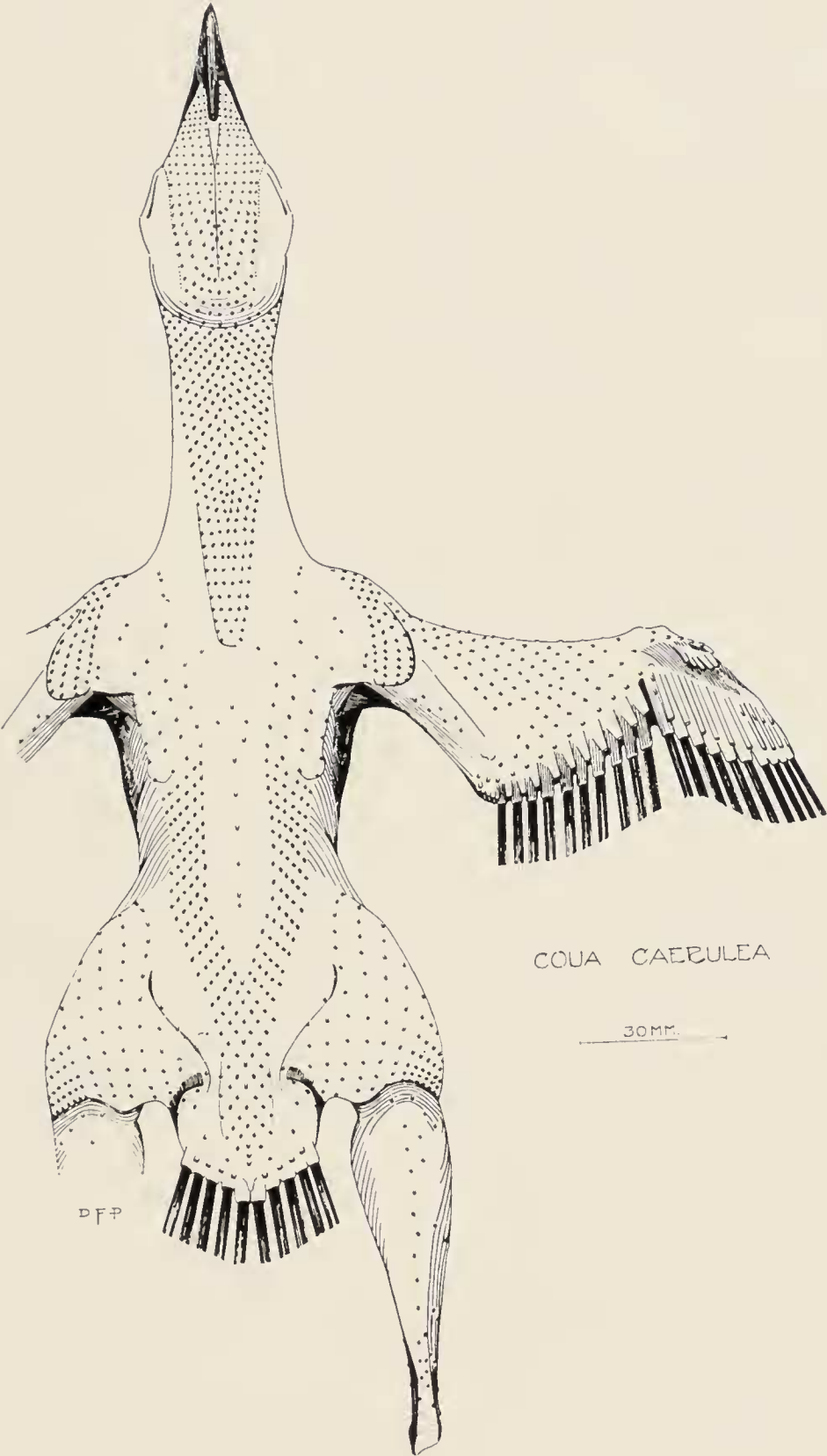


FIG. 2. Dorsal view of *Coua caerulea* showing feather tracts.

most devoid of feathers. There is, however, a loop formed by a single row of feathers, which is continuous below with the anterior tract of the thigh. Posterosuperiorly, the loop joins the upper margin of the femoral tract.

Notes on the molt. The specimen I had for study (No. 5529, Rand and Archbold collection) was collected May 10, 1930, 40 km. northwest of Maroantsetra, and exhibits an extensive molt. On the left wing, the fifth and seventh (innermost counted as first) primaries are nearly full length, but are sheathed at the base, while the fourth is only about 30 mm. in total length. On the right wing, the seventh primary is the only one still sheathed at the base. Of the secondaries (outermost considered as the first), the first of the left wing is nearly full length, but retains a sheath at its base; in the right wing, the first, third, and seventh secondaries still possess basal sheaths. The rectrices are nearly equal in diameter, but on the right side, the first (innermost) and the fourth possess basal sheaths, and on the left side, the second and fourth possess such sheaths. An extensive molt is evidenced throughout the dorsal regions, involving the capital, occipital, humeral, femoral, anterior crural, and the spinal tracts. There is likewise an extensive molt of the ventral tracts, extending from the inter-ramal region to the under tail-coverts.

Too little is yet known about the anatomy of *Coua* to permit any statement regarding its close affinities. It is interesting to note, however, that if we were to rely on the three anatomical features used by Beddard (1885:187; 1898:281), the presence of the marginal apteria bordering the inter-ramal tract would place this genus in close relationship with *Geococcyx*, *Crotophaga*, and *Guira*, three New World genera. The uncertain reliability of this single morphological character encourages caution in the selection and utilization of anatomical characters to determine relationships on the subfamily level.

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ARBOR, MARCH 11, 1952

NEW LIFE MEMBER



Born in Cineinnati, Ohio, on October 20, 1882, Mr. Christian J. Goetz became an extremely active bird bander in the late 1920's after aequiring a deep interest and knowledge of wildlife through various conservation projeets and years of hunting and fishing. He retired from banding work in 1952 after ringing 31,181 birds in four states. Dueks werc his favorites and of these he banded more than five thousand, mostly on the property of the Duck Island Hunting Club at Banner, Illinois. Mr. Goetz was a member of this elub for many years. His plans for the future include many years of bird-watching and small-mouth bass fishing along the streams of southern Ohio. This photo was made as Mr. Goetz banded a hen Mallard at the Duck Island Club in December, 1938.